**An Overview of Suomi-NPP VIIRS Capabilities: One Year Following Launch**

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**Introduction**

The launch of the Suomi National Polar-orbiting Partnership (S-NPP) satellite in October 2011 has ushered in a new era of technological advancements of low earth orbiting satellite (LEO) sensors. This effort focuses on the Visible Infrared Imager Radiometer Suite (VIIRS), an imaging sensor that incorporates many of the best features from its heritage sensors: Advanced Very High Resolution Radiometer (AVHRR), Operational Linescan System (OLS), and Moderate-Resolution Imaging Spectroradiometer (MODIS). The Naval Research Laboratory in Monterey, California (NRL-MRY) is part of the Suomi-NPP VIIRS Imagery and Visualization Team, providing VIIRS imagery and derived products via its two web sites: NRL-VIIRS and NexSat (see below).

**VIIRS Performance**

The following examples reflect recent activity at NRL-MRY in developing and demonstrating the unique next generation abilities of VIIRS. Of the 22 available channels, NRL-MRY has placed great emphasis on the Day Night Band (DNB), a low light sensor that improves upon DMSP OLS technology in providing high fidelity, finer spatial resolution and significantly improved 14-bit digitalization vs 6-bit (64 gray shades) for OLS.

**VIIRS Monitors 2012 Weather Events**

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**Unprecedented Fine Detail at Night**

With the addition of lunar irradiance prediction model, a form of "normalisation" converts the large dynamic range of radiances (left image) toward significantly improved reflectance enhancements. (right image), resulting in day-like detail. (Miller and Turner, IEEE Trans. Geosci. Remote Sens., 47, No. 7, 2009)

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**Hotspot Monitoring**

Natural (false) color during the day and DNB at night capture the intense wildfire at the New Mexico Whiskey Balance Complex

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**Tropical Cyclone (Jasmine) at night**

Located in the South Pacific near New Caledonia

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**Low Clouds at Night**

VIIRS derived "point source product" using DNB and IR channels. Two "hotspots" within the lava flow consisting of a yellow dot within a red dot interpreted as a thermal signature within a broader light signature.

(a) Just below the Kilauea lava field the left bright dot is at Kilauea's summit vent, while the small dot to the east is the Pu‘u Oo eruptive vent on Kilauea's east rift zone. Cyan feature extending from Pu‘u Oo to the coast is the lava flow field.

(b) In addition to the ongoing volcanic activity, a rather large brush fire occurred during this time within the lower central region.

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**Fishing Activity**

DNB + IR view of typical fishing activity at night (yellow dots = red annotations) in the Sea of Japan.

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